WHAT IS CLAIMED IS:

1. A method for producing a residuum specimen from a crude, comprising:

cooling a sample of the crude to an average temperature of about -200 to 0°C;

placing the cooled sample in a chamber,

wherein the chamber has a absolute pressure within the range of about 10^{-3} to 10^{-6} Torr, and

a fixed temperature within the range of about 340 to 540 °C,

such that the combination of the absolute pressure and the fixed temperature is equivalent to an atmospheric equivalent boiling point for the residuum to be produced,

such that the sample is so small or so thin so as to reach equilibrium with the temperature in the chamber within 15 minutes; and

keeping the sample in the chamber at the absolute pressure and the fixed temperature for 5 to 60 minutes until essentially only the residuum remains from the sample.

2. A crude oil residuum made by the method according to claim 1.

3. A method according to claim 1, wherein the crude is a crude fraction.

4. A method according to claim 1, wherein the sample has a mass of 2 to 200 mg.

5. A method according to claim 1, wherein a volatilized component of the sample is analyzed.

6. A method according to claim 1, wherein the residuum is removed from the chamber and analyzed.

7. A method according to claim 6, wherein the residuum is analyzed by at least one analysis method selected from the group consisting of prediction of potential asphalt, prediction of residuum yield, prediction of residuum quality, molecular characterization, and yield-atmospheric equivalent boiling point profile.

8. A method according to claim 7, wherein the analysis method is based on weight or high resolution mass spectrometric methods.

9. A method according to claim 1, wherein the sample comprises 10 to 40 mg of crude or crude fraction and the sample is kept in the chamber for 10 to 20 minutes.

10. A method for determining suitability of a crude as a source for asphalt production, which comprises:

creating a vacuum residuum from a sample of the crude by

cooling the sample to an average temperature within -200 to 0°C,

exposing the sample to an absolute pressure of 10^{-3} to 10^{-6} Torr

and a fixed temperature within the range of 340 to 540°C for 5 to 60 minutes,

such that the combination of the absolute pressure and the fixed temperature is equivalent to an atmospheric equivalent boiling point for the residuum to be produced,

such that the atmospheric equivalent boiling point is determined from a calibration data set of atmospheric or vacuum boiling point from distillation of at least 1 L of the crude;

determining a property of the residuum; and

comparing the property to a database of asphalt performance versus crude selection.

11. A method according to claim 10, further characterized by the calibration of process conditions (process temperature and process vacuum) to an AEBP for the apparatus for a constant process duration by the use of calibrant crudes for which conventional distillation data are used to generate cut temperature-yield profiles which are compared to process temperature-yield data generated in the new method so that process temperature at constant pressure and duration can be equilibrated to AE cut temperature on an equivalent yield basis.

12. A method according to claim 10, wherein the process temperature can be varied for additional experiments while retaining constant pressure and residence times in order to generate additional AEBP equivalent tempera-

tures using the known relationship for cut temperature-yield from conventional distillation data for calibrant crudes.

13. A method according to claim 10, wherein the calibrant crude can be any whole crude or whole crude blend of known or unknown proportions for which conventional distillation data relating yield to distillation cut temperature is or could be made available.

14. A method according to claim 10, further characterized by the generation of complete AEBP versus yield profiles for unknown crudes by varying the residence time of the experiment for calibrant crudes and equilibrating reduced time at constant temperature to reduced AE cut temperature on the basis of changes to yield in the calibrant crude or crudes.

15. A method according to claim 14, wherein the method is used to generate cut temperature-yield profiles for unknown crudes using the reduced time AEBP calibration curve for calibrant crudes, and performing multiple runs on the unknown crude at different residence times.

16. A method according to claim 10, wherein the chamber is connected to a vacuum container of known volume and initially at the absolute pressure.

17. A method for producing vacuum residuum specimen from a whole crude of unlimited origin by weighing a small sample of whole crude into a quartz tube boat, cooling the sample in liquid nitrogen to an average temperature of below 0°C for at least 30 seconds, inserting the sample into the apparatus sample holder, exposing the sample to an absolute pressure of ≤ 1 milliTorr, heating the sample in the apparatus to the target process temperature such that

the combination of process temperature and process pressure results in the target AEBP for the residuum to be produced, holding the sample under target process conditions for the duration of the experiment (preferably less than one hour, typically 15 minutes), removing the residuum from the apparatus, and using the residuum for its intended purposes which may include prediction of potential asphalt or residuum yield and quality, molecular characterization, yield-AEBP profile, or other research or economic considerations.

18. The method of claim 17 is further characterized by the calibration of process conditions (process temperature and process vacuum) to an AEBP for the apparatus for a constant process duration by the use of calibrant crudes for which conventional distillation data are used to generate cut temperature-yield profiles which are compared to process temperature-yield data generated in the new method so that process temperature at constant pressure and duration can be equilibrated to AE cut temperature on an equivalent yield basis.

19. Pursuant to claim 18, the process temperature can be varied for additional experiments while retaining constant pressure and residence times in order to generate additional AEBP equivalent temperatures using the known relationship for cut temperature-yield from conventional distillation data for calibrant crudes.

20. Pursuant to claim 18, a calibrant crude can be any whole crude or whole crude blend of known or unknown proportions for which conventional distillation data relating yield to distillation cut temperature is or could be made available.

21. The method of claim 18 is further characterized by the generation of complete AEBP versus yield profiles for unknown crudes by varying the

residence time of the experiment for calibrant crudes and equilibrating reduced time at constant temperature to reduced AE cut temperature on the basis of changes to yield in the calibrant crude or crudes.

22. Pursuant to claim 21, this technique can then be used to generate cut temperature-yield profiles for unknown crudes using the reduced time AEBP calibration curve for calibrant crudes, and performing multiple runs on the unknown crude at different residence times.

23. A method for maximizing crude as a source for asphalt comprising the steps of claim 1.